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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,741	09/08/2003	Lawrence E. Felton	2550/176	8927
2101	7590	11/26/2004	EXAMINER	
BROMBERG & SUNSTEIN LLP 125 SUMMER STREET BOSTON, MA 02110-1618			LARKIN, DANIEL SEAN	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 11/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,741

Applicant(s)

FELTON ET AL.

Examiner

Daniel S. Larkin

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>27 October 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0077154 (Nagarajan et al.) in view of US 6,448,109 (Karpman).

With respect to the limitations of claim 11, the reference to Nagarajan et al. discloses a wafer level package for micro-electro-mechanical systems comprising creating a sensor through the method of forming a working portion (574) on a first wafer (572); forming a plurality of through holes (554) and a cavity (570) on a second wafer/cap wafer (552); securing the second wafer (552) to the first wafer (572), at least one of the cavity (570) aligning with a working portion (574); and filling the through holes (574) with conductive material (562) to provide a plurality of conductive paths. The reference to Nagarajan et al. fails to disclose creating a plurality of sensors and dicing the first and second wafers to create a plurality of sensors. The reference to Karpman discloses a wafer level method of capping multiple MEMS elements whereby a plurality of working portions (14) are attached to a first wafer (12), a plurality of second wafers/caps (6) are attached to a template (2); the plurality of caps (6) are brought into

Art Unit: 2856

sealing contact with the first wafer (12) such that a cavity is formed around the each working portion formed on the first wafer (12). The reference further discloses that the MEMS wafer 12 is then diced into individual completed MEMS chips along dice lines (20). Creating a plurality of MEMS chips would have been obvious to one of ordinary skill in the art as a means of more cheaply producing the chip by creating them in mass, which reduces material costs and material waste.

With respect to the limitation of claim 12, the reference to Nagarajan et al. discloses that an electroless-plating step (510) is performed to filled the through holes (574) with a conductive material (562), such as nickel.

With respect to the limitation of claim 15, the reference to Nagarajan et al. discloses that the conductive material (562) contacts the working portion through a MEMS pad (579).

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0077154 (Nagarajan et al.) in view of US 6,448,109 (Karpman) as applied to claim 11 above, and further in view of US 6,384,353 (Huang et al.).

With respect to the limitation of claim 13, the reference to Nagarajan et al. discloses using Frit glass to seal the cap to the MEMS wafer. The reference to Nagarajan et al. fails to disclose using a screen-printed glass. The reference to Huang et al. discloses that the Prior Art teaches the uses of a screen print of glass used to separate the cap from a MEMS wafer. Using glass to seal the wafers together would have been obvious to one of ordinary skill in the art because glass is not porous which

helps to hermitically seal the MEMS device. Additionally, glass has a similar coefficient of expansion as silicon substrates, which are used to hold the MEMS device.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0077154 (Nagarajan et al.) in view of US 6,448,109 (Karpman) as applied to claim 11 above, and further in view of US 2003/0038327 (Smith).

With respect to the limitations of claim 14, the reference to Nagarajan et al. discloses all of the limitations of claim 11. The reference to Nagarajan et al. discloses that the MEMS structure (574) comprises a movable member (576); however, the reference fails to expressly disclose that the MEMS structure contains accelerometers or gyroscopes. The reference to Smith discloses a hermetically sealed silicon micro machined electromechanical system device whereby the reference discloses that the MEMS sensor may include an acceleration sensor, filter, a pressure sensor, or a gyroscope. Providing a plurality of MEMS sensors containing accelerometers or gyroscopes would have been obvious to one of ordinary skill in the art given that MEMS devices are well known in their use in detecting motion and forces in tight enclosures and accelerometers and gyroscopes are well-known MEMS sensor as disclosed by Smith.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0077154 (Nagarajan et al.) in view of US 6,448,109 (Karpman) as applied to claim 11 above, and further in view of US 6,633,079 (Cheever et al.).

With respect to the limitation of claim 16, the reference to Karpman discloses placing a MEMS structure (14) and circuitry (28) within the cavity used to seal the MEMS structure (14). The reference to Karpman and Nagarajan et al. both fail to disclose a working portion containing both a MEMS structure and circuitry. The reference to Cheever et al. discloses the working portion of the die/substrate (17) includes MEMS structure, (see claim 9) as well as circuitry (15). Providing circuitry with the structure would have been obvious to one of ordinary skill in the art as a means of minimizing the size of the sensor by eliminating the need to provide an external circuit or a separate substrate to carry the circuit.

Response to Arguments

6. Applicants' arguments filed 27 October 2004 have been fully considered but they are not persuasive.

In response to applicants' argument that the rejection of independent claim 11 is improper because the secondary reference to Karpman is inappropriate in view of 35 U.S.C. §103(c), page 6, lines 26-28 through page 7, lines , the examiner respectfully disagrees. While applicants' invention and the Karpman patent may have the same assignee, the reference to Karpman does not fall within the provisions of 35 U.S.C. §103 (c) because Karpman does not fall under the statutes of 35 USC 102(e) as applicants argue. The publication date of the Karpman patent is 10 September 2002. Applicants' earliest filing date is 08 September 2003. Therefore, the reference to

Karpman qualifies as a prior art reference under 35 U.S.C. §102(a), which is not subject to the provisions of 35 U.S.C. §103(c), which states "subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person".

Conclusion

THIS ACTION IS MADE FINAL. Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 2856

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Larkin whose telephone number is 571-272-2198. The examiner can normally be reached on 8:00 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Larkin
AU 2856
18 November 2004


DANIEL S. LARKIN
PRIMARY EXAMINER